Opportunity Title: Parallel Computation of Orbit Propagation Uncertainty Using GPU
Opportunity Reference Code: ICPD-2025-55

Organization Office of the Director of National Intelligence (ODNI)

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How to Apply **Create and release your Profile on Zintellect** – Postdoctoral applicants must create an account and complete a profile in the on-line application system. **Please note: your resume/CV may not exceed 3 pages.**

Complete your application – Enter the rest of the information required for the IC Postdoc Program Research Opportunity. The application itself contains detailed instructions for each one of these components: availability, citizenship, transcripts, dissertation abstract, publication and presentation plan, and information about your Research Advisor co-applicant.

Additional information about the IC Postdoctoral Research Fellowship Program is available on the program website located at: https://orise.orau.gov/icpostdoc/index.html.

If you have questions, send an email to ICPostdoc@orau.org. Please include the reference code for this opportunity in your email.

Application Deadline 2/28/2025 6:00:00 PM Eastern Time Zone

Description **Research Topic Description, including Problem Statement:**

The goal of space situational awareness is to accurately and quickly locate an ever-growing number of space objects. For this research topic, we aim to measure accuracy uncertainty, and benchmark and improve computing performance using the latest advances in parallel techniques, such as GPU architectures.

Example Approaches:

References: (1) K. Liu, B. Jia, Genshe Chen, K. Pham, and E. Blasch, (2015) "A real-time orbit satellites uncertainty propagation and visualization system using graphics computing unit and multi-threading processing," 2015 IEEE/AIAA 34th Digital Avionics Systems Conference (DASC), Prague, Czech Republic, 2015, pp. 8A2-1- 8A2-10, doi: 10.1109/DASC.2015.7311467. (2) S. Setty (2020), "Orbit Uncertainty Propagation for Space Object Catalogue Maintenance," Dissertation, Universität der Bundeswehr München.

Linkage to current DNI's S&T Priorities:
Develop/enhance capabilities to characterize the space operating environment and improve global space situational awareness

Key Words: Orbit propagation, propagation uncertainty, covariance, parallel computation, GPU.

Qualifications **Postdoc Eligibility**

- U.S. citizens only
- Ph.D. in a relevant field must be completed before beginning the appointment and within five years of the appointment start date

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- Proposal must be associated with an accredited U.S. university, college, or U.S. government laboratory
- Eligible candidates may only receive one award from the IC Postdoctoral Research Fellowship Program

Research Advisor Eligibility

- Must be an employee of an accredited U.S. university, college or U.S. government laboratory
- Are not required to be U.S. citizens

Point of Contact Keri Tarwater

Eligibility Requirements

- **Citizenship:** U.S. Citizen Only
- **Degree:** Doctoral Degree.
- **Discipline(s):**
  - **Chemistry and Materials Sciences** (12)
  - **Communications and Graphics Design** (3)
  - **Computer, Information, and Data Sciences** (17)
  - **Earth and Geosciences** (21)
  - **Engineering** (27)
  - **Environmental and Marine Sciences** (14)
  - **Life Health and Medical Sciences** (45)
  - **Mathematics and Statistics** (11)
  - **Other Non-Science & Engineering** (2)
  - **Physics** (16)
  - **Science & Engineering-related** (1)
  - **Social and Behavioral Sciences** (30)